

(b) an axially extending, cylindrical, permanent magnet shaft extending coaxially through said annular stator structure; [and]

(c) said axially extending, cylindrical, permanent magnet shaft having a smooth external surface along a portion thereof with axially alternating N and S poles defined circumferentially in an outer periphery of said portion of said axially extending, cylindrical, smooth, permanent magnet shaft; [and]

(d) said axially extending, cylindrical, permanent magnet shaft is formed from one homogeneous piece of material; and

(e) said portion of said axially extending, cylindrical, permanent magnet shaft is hollow.

Please insert the following new claims:

25. A linear stepper motor, as defined in Claim 23, wherein: said stator structure includes annular disks of a high lubricity material spacing apart elements of said stator structure and serving as bearing surfaces for said axially extending shaft.

26. A linear stepper motor, as defined in Claim 23, wherein: said axially extending, cylindrical, smooth, permanent magnet shaft can rotate 360° continuously or intermittently in any direction, regardless of whether or not said linear stepper motor is energized.

27. A linear stepper motor, as defined in Claim 23, wherein: said axially extending, cylindrical, smooth, permanent magnet shaft is back-driveable.

28. A linear stepper motor, as defined in Claim 23, wherein: said linear stepper motor is constructed to operate in any orientation.

29. A linear stepper motor, as defined in Claim 23, wherein: said stator structure

has modular stator stacks with pole pieces to concentrate and direct magnetic flux.

30. A linear stepper motor as defined in Claim 23, wherein: said stator structure has conventionally wound coils.

31. A linear stepper motor, as defined in Claim 23, wherein: said linear stepper motor includes no lead screw and no ball screw.

32. A linear stepper motor, as defined in Claim 23, wherein: said linear stepper motor requires no lubrication of coengaged parts thereof.

33. A linear stepper motor, as defined in Claim 23, wherein: said linear stepper motor requires no conversion of rotary motion to linear motion.

34. A linear stepper motor, as defined in Claim 24, wherein: said portion of said axially extending, cylindrical, permanent magnet shaft is hollow.

35. A linear stepper motor, as defined in Claim 24, wherein: said axially extending, cylindrical, smooth, permanent magnet shaft can rotate 360° continuously or intermittently in any direction, regardless of whether or not said linear stepper motor is energized.

36. A linear stepper motor, as defined in Claim 24, wherein: said axially extending, cylindrical, smooth, permanent magnet shaft is back-driveable.

37. A linear stepper motor, as defined in Claim 24, wherein: said linear stepper motor is constructed to operate in any orientation.

38. A linear stepper motor, as defined in Claim 24, wherein: said stator structure has

AMENDMENT
S/N 09/783,179, FILED 02/12/01

PATENT
226-133

modular stator stacks with pole pieces to concentrate and direct magnetic flux.

39. A linear stepper motor as defined in Claim 24, wherein: said stator structure has conventionally wound coils.

40. A linear stepper motor, as defined in Claim 24, wherein: said linear stepper motor includes no lead screw and no ball screw.

41. A linear stepper motor, as defined in Claim 24, wherein: said linear stepper motor requires no lubrication of coengaged parts thereof.

42. A linear stepper motor, as defined in Claim 24, wherein: said linear stepper motor requires no conversion of rotary motion to linear motion.